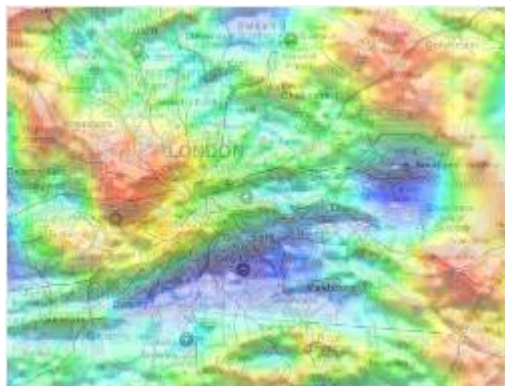


Michael de Freitas¹ and Katherine Royse² say geologists and engineers from all backgrounds can now contribute to revealing the nature of the ground beneath London, its geological history, and predicting ground conditions within the Basin.

Geoscientist 19.10 October 2009



Everyone associates London with the upper crust, and probably no part of it is better investigated, anywhere in the world, than under our capital city. Countless vertical boreholes have been drilled for ground investigation, aggregate evaluation and water supply, kilometres of horizontal tunnels excavated for railways, cable tunnels, water tunnels and sewers. You might think that the geology of London is, therefore, well known - but not so!

London has a history of "anomalous ground conditions", yet because many of these (often nasty) surprises have been discovered in isolation, in association with particular investigations, they tend to have been merely "noted", and no further work has ensued. Instead, one more "anomaly" has been added to a growing list within the Basin. Such conditions can prove costly if not picked up in initial site surveys, and may lead to project over-runs. This unsatisfactory situation could be about to change.

In the 9th Glossop Lecture to the Engineering Group of the Society, one of us (de Freitas) presented the results of research into possible relationships between these anomalies. The hypothesis was advanced that many could be associated with movement in the Variscan basement below London. The orientation of its basic lineaments would make the basement vulnerable to shear displacement under the stress directions associated with the opening of the North Atlantic and the closing of Tethys. If pull-apart basins were generated by such displacements, a series of local grabens, with their associated and intervening horsts, could come to dominate the Mesozoic and Tertiary sedimentary environment of the region.

Further, such an evolution would impose a structural framework inherited from lineaments within the basement. It is reasonable to expect that such weaknesses would be remobilised under appropriate stress conditions, and it is interesting to speculate how the basement may have responded to the glacial loading of the crust to its north, during the Pleistocene. This could be one explanation for the linear sections of dry valleys and tributaries of the River Thames having the fractal characters of a shear zone. The model provides a framework against which the known geology of the London Basin and its anomalies can be tested. Everyone, from any walk of geology, can contribute their particular piece of evidence to the picture.



Open forum

An open forum – The London Basin Forum - now exists to draw all this evidence together. It would also be interesting to hear from those working in adjacent areas, for anomalies similar to those found in London also occur in the Hampshire and Paris basins. The geological model that emerges will be of national and international significance, and will be the best example of how geological processes, environmental change and human development affect the behaviour and character of the Earth's materials from the nano- to macro- scale.

The Forum has a website, hosted by British Geological Survey (<http://www.bgs.ac.uk/londonBasinForum/>), where there is a portal for depositing information, and a means for registering yourself as a Forum member. There is no charge to join, no fees to participate and no cost to benefit from the project.

The October Meeting, on Wednesday 28, is open to, as its remit is to bring the project to as large a geological and engineering audience as possible. Further meetings are planned for 2010 and 2011, the latter being an Ordinary Meeting of the Society. For a timetable of the day's events, please consult the Events section of this website.

The Atlas

The results of this project will be assembled as an Atlas for the London Basin to be published in 2014. This will present the findings essentially as a series of maps, recording the history of the Basin and its relationship with features of known geological, hydrogeological, geotechnical and geo-environmental significance. Examples of its content and presentation will be presented at the meeting on the 28th. Sponsors will be needed and any company interested in furthering this work and being associated with it is invited to contact Michael de Freitas at info@firststeps.eu.com.

Reference

- de Freitas, M H 2009: Geology - its principles, practice and potential in Geotechnics. 9th Glossop Lecture. Quarterly Journal of Engineering Geology and Hydrogeology. 42, (in press).

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